

# Unit Outline (Higher Education)

**Institute / School:** Institute of Education, Arts & Community

**Unit Title:** Numeracy and Digital Technology

**Unit ID:** ECCEL2017

**Credit Points:** 15.00

**Prerequisite(s):** Nil

**Co-requisite(s):** Nil

**Exclusion(s):** (EDECE2017 and EEZED1721)

**ASCED:** 070101

## Description of the Unit:

This course is designed to provide Pre-Service Teachers (PSTs) with a sound understanding of the mathematics in the lives of babies, toddlers, and young children. It will explore theoretical, cultural, historical, and current approaches of teaching play-based mathematics. PSTs will explore the use of digital technology with children and as a tool for pedagogical practice. This course aims to build understanding of PSTs own values, beliefs, and preferences toward mathematics and digital technology in their lives, and explore how these can affect their pedagogical practices. PSTs will reflect on children's prior knowledge and interests, and the importance of family preferences and expectations. They will explore how these influence the planning of experiences and include ways to document and share children's mathematical learning with families. Throughout the course, the PSTs will build a resource of mathematical learning experiences informed by the early childhood learning frameworks. They will explore how learning experiences can be modified to meet the needs of a range of children including different ages, abilities, interests, and backgrounds. This course supports the first year professional experience in the Bachelor of Education (Early Childhood and Primary) and Bachelor of Education (Early Childhood Education) in which students complete 20 days in an education setting specified below for their particular program. Students are required to complete the activities outlined in Professional Experience Assessment Report (Form A). This will take place in collaboration with their Mentor Teacher/Supervisor in the setting in which the placement occurs. The students will also document their professional learning in Professional Experience Pre Service Teacher Learning Log (Form B) supported by their assigned University Mentor.

Education Setting Bachelor of Education (Early Childhood and Primary): 3 - 5 year old

**Grade Scheme:** Graded (HD, D, C, P, MF, F, XF)

## Work Experience:

Student is undertaking work experience in industry where learning and performance is not directed by the provider, but support is received from the provider. Fees (provider may charge a student contribution amount or

tuition fee).

**Placement Component:** Yes - 20 days

**Supplementary Assessment:** No

Supplementary assessment is not available to students who gain a fail in this Unit.

**Course Level:**

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Introductory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intermediate	<input type="checkbox"/>	<input type="checkbox"/>	✓	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advanced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Learning Outcomes:**

On successful completion of the course the students are expected to be able to:

**Knowledge:**

- K1.** Examine and review historical, cultural, and current teaching approaches for teaching early childhood mathematics.
- K2.** Make connections between teachers' actual and perceived mathematical abilities and confidence levels and their pedagogical practices.
- K3.** Explore how children's positive mathematical experiences can build self-efficacy.
- K4.** Identify ways to explore digital technology with children and as a tool for pedagogical practice.

**Skills:**

- S1.** Observe and identify the mathematics in children's interactions during individual, small group, and whole group experiences.
- S2.** Identify technologies to facilitate children's mathematical learning.
- S3.** Build personal understanding of mathematical concepts and terminology.
- S4.** Build an understanding of the importance of play-based learning.
- S5.** Share information with families on children's mathematical and technological learning.

**Application of knowledge and skills:**

- A1.** Build a collection of play-based learning experiences that can be used to teach mathematical and technological content in an ECE setting.
- A2.** Understand how to modify learning experiences to meet the needs and interests of diverse children.
- A3.** Design learning opportunities that incorporate mathematics into other curriculum areas.
- A4.** Develop a Teacher Performance Assessment e-portfolio demonstrating teaching competency in five teaching practices
- A5.** Set personal learning goals and document evidence of professional practice, professional knowledge and professional engagement as articulated in the Australian Professional Standards for Teachers (Graduate Level) and as part of the Graduate Teacher Performance Assessment.

- A6.** Bring insights from school-based experiences to Federation University studies and share these in professional conversations with peers and lecturers
- A7.** Practise teaching and put into practice feedback regarding personal teaching performance
- A8.** Plan, deliver and evaluate lessons so that student learning is effectively and clearly conceptualised and organized
- A9.** Work collaboratively and communicate effectively with students, professionals, colleagues and parents.

### Unit Content:

- Historical and current teaching practices in early childhood mathematics and digital technology Age-appropriate mathematical terminology and experiences
- Personal values and biases toward mathematics Reflective Practice
- Planning for learning including those with diverse linguistic, religious, and socio-economic backgrounds Building children's confidence and wellbeing
- Sourcing and planning with natural and recycled manipulatives Linking learning experiences to early years frameworks
- Use of technology in young children's learning Sharing children's learning with families
- Identifying and connecting with the mathematical content in storybooks
- How young children learn mathematics through play and everyday experiences
  - Complete 20 days in an education setting specified for the particular course

### FEDTASKS

Federation University Federation recognises that students require key transferable employability skills to prepare them for their future workplace and society. FEDTASKS (**T**ransferable **A**tttributes **S**kills and **K**nowledge) provide a targeted focus on five key transferable Attributes, Skills, and Knowledge that are be embedded within curriculum, developed gradually towards successful measures and interlinked with cross-discipline and Co-operative Learning opportunities. *One or more FEDTASK, transferable Attributes, Skills or Knowledge must be evident in the specified learning outcomes and assessment for each FedUni Unit, and all must be directly assessed in each Course.*

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 1 Interpersonal	Students will demonstrate the ability to effectively communicate, inter-act and work with others both individually and in groups. Students will be required to display skills in-person and/or online in: <ul style="list-style-type: none"> <li>• Using effective verbal and non-verbal communication</li> <li>• Listening for meaning and influencing via active listening</li> <li>• Showing empathy for others</li> <li>• Negotiating and demonstrating conflict resolution skills</li> <li>• Working respectfully in cross-cultural and diverse teams.</li> </ul>	K4, S1, S5	AT2

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 2 Leadership	Students will demonstrate the ability to apply professional skills and behaviours in leading others. Students will be required to display skills in: <ul style="list-style-type: none"> <li>• Creating a collegial environment</li> <li>• Showing self-awareness and the ability to self-reflect</li> <li>• Inspiring and convincing others</li> <li>• Making informed decisions</li> <li>• Displaying initiative</li> </ul>	K2, S4, S5, A2, A3	AT1, AT2
FEDTASK 3 Critical Thinking and Creativity	Students will demonstrate an ability to work in complexity and ambiguity using the imagination to create new ideas. Students will be required to display skills in: <ul style="list-style-type: none"> <li>• Reflecting critically</li> <li>• Evaluating ideas, concepts and information</li> <li>• Considering alternative perspectives to refine ideas</li> <li>• Challenging conventional thinking to clarify concepts</li> <li>• Forming creative solutions in problem solving.</li> </ul>	K1, K2, K3, K4, S3, A1, A2	AT1, AT2
FEDTASK 4 Digital Literacy	Students will demonstrate the ability to work fluently across a range of tools, platforms and applications to achieve a range of tasks. Students will be required to display skills in: <ul style="list-style-type: none"> <li>• Finding, evaluating, managing, curating, organising and sharing digital information</li> <li>• Collating, managing, accessing and using digital data securely</li> <li>• Receiving and responding to messages in a range of digital media</li> <li>• Contributing actively to digital teams and working groups</li> <li>• Participating in and benefiting from digital learning opportunities.</li> </ul>	K4, S2, S5, A1	AT1, AT2
FEDTASK 5 Sustainable and Ethical Mindset	Students will demonstrate the ability to consider and assess the consequences and impact of ideas and actions in enacting ethical and sustainable decisions. Students will be required to display skills in: <ul style="list-style-type: none"> <li>• Making informed judgments that consider the impact of devising solutions in global economic environmental and societal contexts</li> <li>• Committing to social responsibility as a professional and a citizen</li> <li>• Evaluating ethical, socially responsible and/or sustainable challenges and generating and articulating responses</li> <li>• Embracing lifelong, life-wide and life-deep learning to be open to diverse others</li> <li>• Implementing required actions to foster sustainability in their professional and personal life.</li> </ul>	Not applicable	Not applicable

### Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
A4, A5, A6, A7, A8, A9	Placement component Complete Professional Experience Assessment Report (Form A) in collaboration with mentor teacher Establish, reflect and evaluate learning goals and professional learning against the Australian Professional Standards for Teachers in Pre Service Teaching Learning Log (Form B) Completion of 20 days placement in the education setting specified for their particular program	Hurdle	S/U
K1, K2, K3, K4, S1, S2, A2, A3	Explore the role of the educator in teaching early childhood mathematics, drawing connections to their own personal values and biases around mathematical understandings and teaching mathematics in an ECE setting.	Academic Essay	40% - 60%
K2, S1, S2, S3, S4, S5, A1, A2, A3	Using provided scenarios, report on the range of mathematical and/or technology concepts the children may be exploring and discuss ways teachers are supporting the children's learning in these areas. Identify a range of learning experiences that focus on mathematical and technology development that can follow on from your chosen scenario, including information for parents/caregivers.	Report and Planning	40% - 60%

#### Adopted Reference Style:

APA

Refer to the [library website](#) for more information

Fed Cite - [referencing tool](#)

**Professional Standards / Competencies:**
**Australian Professional Standards for Teachers (AITSL) - Graduate Teacher: Initial**

Attribute	Assessed	Level
Professional Knowledge		
1. Know students and how they learn		
1.1 Physical, social and intellectual development and characteristics of students Demonstrate knowledge and understanding of physical, social and intellectual development and characteristics of students and how these may affect learning.	Yes	Introductory
1.2 Understand how students learn Demonstrate knowledge and understanding of research into how students learn and the implications for teaching.	Yes	Introductory
1.3 Students with diverse linguistic, cultural, religious and socioeconomic backgrounds Demonstrate knowledge of teaching strategies that are responsive to the learning strengths and needs of students from diverse linguistic, cultural, religious and socioeconomic backgrounds.	Yes	Introductory
1.4 Strategies for teaching Aboriginal and Torres Strait Islander students Demonstrate broad knowledge and understanding of the impact of culture, cultural identity and linguistic background on the education of students from Aboriginal and Torres Strait Islander backgrounds.	Yes	Introductory
1.5 Differentiate teaching to meet the specific learning needs of students across the full range of abilities Demonstrate knowledge and understanding of strategies for differentiating teaching to meet the specific learning needs of students across the full range of abilities.	Yes	Introductory
1.6 Strategies to support full participation of students with disability Demonstrate broad knowledge and understanding of legislative requirements and teaching strategies that support participation and learning of students with disability	Yes	Introductory
2. Know the content and how to teach it		
2.1 Content and teaching strategies of the teaching area Demonstrate knowledge and understanding of the concepts, substance and structure of the content and teaching strategies of the teaching area.	Yes	Introductory
2.2 Content selection and organisation Organise content into an effective learning and teaching sequence.	Yes	Introductory

2.3 Curriculum, assessment and reporting Use curriculum, assessment and reporting knowledge to design learning sequences and lesson plans.	Yes	Introductory
2.4 Understand and respect Aboriginal and Torres Strait Islander people to promote reconciliation between Indigenous and non-Indigenous Australians Demonstrate broad knowledge of, understanding of and respect for Aboriginal and Torres Strait Islander histories, cultures and languages.	Yes	Introductory
2.5 Literacy and numeracy strategies Know and understand literacy and numeracy teaching strategies and their application in teaching areas.	Yes	Introductory
2.6 Information and Communication Technology (ICT) Implement teaching strategies for using ICT to expand curriculum learning opportunities for students.	Yes	Introductory

#### Professional Practice

### 3. Plan for and implement effective teaching and learning

3.1 Establish challenging learning goals Set learning goals that provide achievable challenges for students of varying abilities and characteristics.	Yes	Introductory
3.2 Plan, structure and sequence learning programs Plan lesson sequences using knowledge of student learning, content and effective teaching strategies.	Yes	Introductory
3.3 Use teaching strategies Include a range of teaching strategies.	Yes	Introductory
3.4 Select and use resources Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning.	Yes	Introductory
3.5 Use effective classroom communication Demonstrate a range of verbal and non-verbal communication strategies to support student engagement.	Yes	Introductory
3.6 Evaluate and improve teaching programs Demonstrate broad knowledge of strategies that can be used to evaluate teaching programs to improve student learning.	Yes	Introductory
3.7 Engage parents/ carers in the educative process Describe a broad range of strategies for involving parents/carers in the educative process.	Yes	Introductory

### 4. Create and maintain supportive and safe learning environments

<p>4.1 Support student participation Identify strategies to support inclusive student participation and engagement in classroom activities.</p>	<p>Yes</p>	<p>Introductory</p>
<p>4.2 Manage classroom activities Demonstrate the capacity to organise classroom activities and provide clear directions.</p>	<p>Yes</p>	<p>Introductory</p>
<p>4.3 Manage challenging behaviour Demonstrate knowledge of practical approaches to manage challenging behaviour.</p>	<p>Yes</p>	<p>Introductory</p>
<p>4.4 Maintain student safety Describe strategies that support students' wellbeing and safety working within school and/or system, curriculum and legislative requirements.</p>	<p>Yes</p>	<p>Introductory</p>
<p>4.5 Use ICT safely, responsibly and ethically Demonstrate an understanding of the relevant issues and the strategies available to support the safe, responsible and ethical use of ICT in learning and teaching.</p>	<p>Yes</p>	<p>Introductory</p>
<p>5. Assess, provide feedback and report on student learning</p>		
<p>5.1 Assess student learning Demonstrate understanding of assessment strategies, including informal and formal, diagnostic, formative and summative approaches to assess student learning.</p>	<p>Yes</p>	<p>Introductory</p>
<p>5.2 Provide feedback to students on their learning Demonstrate an understanding of the purpose of providing timely and appropriate feedback to students about their learning.</p>	<p>Yes</p>	<p>Introductory</p>
<p>5.3 Make consistent and comparable judgements Demonstrate understanding of assessment moderation and its application to support consistent and comparable judgements of student learning.</p>	<p>Yes</p>	<p>Introductory</p>
<p>5.4 Interpret student data Demonstrate the capacity to interpret student assessment data to evaluate student learning and modify teaching practice.</p>	<p>Yes</p>	<p>Introductory</p>
<p>5.5 Report on student achievement Demonstrate understanding of a range of strategies for reporting to students and parents/carers and the purpose of keeping accurate and reliable records of student achievement.</p>	<p>Yes</p>	<p>Introductory</p>

## Professional Engagement

### 6. Engage in professional learning



6.1 Identify and plan professional learning needs Demonstrate an understanding of the role of the Australian Professional Standards for Teachers in identifying professional learning needs.	Yes	Introductory
6.2 Engage in professional learning and improve practice Understand the relevant and appropriate sources of professional learning for teachers.	Yes	Introductory
6.3 Engage with colleagues and improve practice Seek and apply constructive feedback from supervisors and teachers to improve teaching practices.	Yes	Introductory
6.4 Apply professional learning and improve student learning Demonstrate an understanding of the rationale for continued professional learning and the implications for improved student learning.	Yes	Introductory
7. Engage professionally with colleagues, parents/carers and the community		
7.1 Meet professional ethics and responsibilities Understand and apply the key principles described in codes of ethics and conduct for the teaching profession.	Yes	Introductory
7.2 Comply with legislative, administrative and organisational requirements Understand the relevant legislative, administrative and organisational policies and processes required for teachers according to school stage.	Yes	Introductory
7.3 Engage with the parents/carers Understand strategies for working effectively, sensitively and confidentially with parents/carers.	Yes	Introductory
7.4 Engage with professional teaching networks and broader communities Understand the role of external professionals and community representatives in broadening teachers' professional knowledge and practice.	Yes	Introductory